

far from a large town), and he was on equally sound ground when he urged that the teaching of physics should be revived and kept in touch with everyday life, so as to defeat any attempt to standardise it and use it merely as a training in logical method (*cf.* Euclid).

The meeting was saved from the peril of a tame unanimity by a difference of view as to approaching the subject synthetically, *e.g.* by building up a theory of heat from observations of the dissected phenomena of expansion, etc., or analytically, *e.g.* by starting with a steam-engine and inquiring how it works.

The difference was somewhat unreal—at least, the real issues were not clearly defined. Surely the problem is how to harness the “wonder” and “utility” motives, and this has to be solved for each method-unit according to the characteristics of each class and teacher and of the method-unit itself. Here it may be said that the existence of a method-unit was only once referred to, when Mr. F. B. Stead directed attention to the fault that the laboratory exercise that can be done in one lesson period tends to become the unit of teaching. We are of opinion that teachers should give more attention to sectioning their subject into natural method-units, using them for revision, for the pupil's more elaborate note-taking, and for essays. Perhaps the simplest example is “expansion by heat,” which is so obvious that in practice regard to this topic as a method-unit is fairly well observed.

It is not possible within the limits of this article to refer to many useful practical suggestions which teachers may gain by reading this report. We have no doubt that many will be grateful to the Physical Society and to the speakers, not forgetting Dr. H. S. Allen, who organised the symposium. G. F. D.

NOTES.

THE mineral resources of Spitsbergen have lately been receiving much attention. The signing of the armistice has allowed the two British companies which hold the principal mining estates in that country to make plans for resuming operations. A correspondence in the *Times*, initiated by Prof. F. Haverfield, of Oxford, has dealt with the value of the coal and iron-ores. Prof. Haverfield, who seems to prefer the German spelling of Spitsbergen with a “z,” quotes Swedish geologists as denying the existence of high-grade iron-ores, and he characterises the attempts to utilise Spitsbergen commercially as a long series of failures from the time of the Dutch onwards. In these respects he has been misinformed. The Dutch and English whalers, and later the Russian and Norwegian trappers, did a rich trade in Spitsbergen produce. Mining ventures have not always been successful, but cases of failure have been due, not to lack of mineral ores, but to ignorance of Spitsbergen, to lack of political control in the country, and, in some instances, to mismanagement and amateur effort. During the war various Norwegian and Swedish companies, in several cases trespassers on British estates, mined large quantities of coal. This year about 100,000 tons of coal were sent to Scandinavian ports. It is merely a question of effort to make Spitsbergen one of the chief coal-producing countries in Europe. The accessible coal-

fields are estimated to have a content of at least 4,000,000,000 tons of good steam-coal. The iron-ore deposits have yet to be examined by competent geologists and mining engineers, but the samples brought to this country promise well. Other mineral resources include gypsum in enormous quantities, asbestos, copper-ore, oil shale, and probably free oil. The mineral prospects of Spitsbergen are great, but, with the exception of coal and gypsum, need to be thoroughly prospected by qualified men before commercial development can proceed. Meanwhile, it is essential that Great Britain should keep a watchful eye on the fate of this *terra nullius*, in which British subjects have the principal claims.

WITH the view of meeting the growing demand for technical literature, the council of the Chemical Society decided early in 1917 to increase the scope of the library of the society by a more liberal provision of suitable technical works and journals. It was also thought that by placing the existing library of 23,000 volumes and the proposed extension at the disposal of members of other societies and associations they might relieve themselves of the necessity of collecting and maintaining the literature relating to their special subjects, and assist in the formation of a representative library of chemical literature, such as would be difficult to obtain by individual effort. A conference of representatives of societies and associations connected with chemical science and industry was held to consider the means by which other societies, etc., might co-operate in this extension, and financial assistance was afterwards offered by the following societies, etc.:—Association of British Chemical Manufacturers, Biochemical Society, Faraday Society, Institute of Chemistry, Society of Dyers and Colourists, and Society of Public Analysts. Members of these contributing societies, etc., will be permitted to consult the library and borrow books from January 1, 1919. The hours of opening the library will be as follows:—Mondays, Wednesdays, and Thursdays, from 10 a.m. to 6 p.m.; Tuesdays and Fridays, from 10 a.m. to 9 p.m.; and Saturdays, from 10 a.m. to 5 p.m.

IN the *Fortnightly Review* for December “Fabricius” refers to the manifesto in support of Germany's policy and action relating to the war signed by ninety-three university professors in that country in 1914, and widely distributed. Among these professors were several occupying scientific chairs, and they must share the righteous condemnation which has been given by the intellectual world outside Germany to their misuse of authority on behalf of dishonourable dreams of conquest. As, however, most of the signatories of the manifesto were representatives of theology, law, literature, and like branches of knowledge, and not of science as it is usually understood, it is misleading to refer to them as a group of “scientists,” as “Fabricius” does in the following extract from his article:—“Scientists are supposed to devote themselves to the promotion of science and of truth, for science is incompatible with untruth. However, the unceasing advocacy of a robber-policy and the exaltation of a robber-morality had so completely destroyed the instinct of responsibility and of truth amongst Germany's intellectual leaders that ninety-three of Germany's most eminent scientists, among them many prominent theologians and legists, disgraced themselves and German science for all time by issuing in 1914 a manifesto to the world in which they mendaciously proclaimed that the other Powers had forced a war upon innocent and peaceful Germany; that upon France, England, and Russia rested the blood-guiltiness; that Germany

fought a clean war of self-defence." We note that the Brussels correspondent of the *Times* reports on December 10 that the Belgian Surgical Society, at its first meeting since July, 1914, solemnly repudiated the notorious manifesto, and resolved to break off all relations with German men of science until the calumnies, especially against Belgian medical men, are publicly disavowed.

We learn with regret of the death on December 9 of Dr. Reginald Percy Cockin, a member of the staff of the London School of Tropical Medicine. Dr. Cockin was educated at Caius College, Cambridge, and the London Hospital. After graduating in arts and medicine in 1906 he entered the Colonial Medical Service, passing "with distinction" in the qualifying course at the London School of Tropical Medicine. In 1908 he proceeded to West Africa, and saw active service as medical officer with the Cross River Expedition into the Munchi country. In 1910 he transferred to Cyprus as district medical officer, and held the post of examiner under pharmaceutical law. During 1913 Dr. Cockin was bacteriologist and resident surgeon at the Colony and Yaws Hospitals in Grenada. He then returned to the London School of Tropical Medicine, occupying successively the posts of demonstrator, assistant in the helminthological department, and assistant entomologist. In 1916 he inaugurated one of the venereal clinics under the Seamen's Hospital Society, and as its director and pathologist organised the clinic at the Albert Dock Hospital with brilliant success. Dr. Cockin's contributions to medical literature were chiefly clinical, dealing with yaws and its treatment, rat-bite fever, and ankylostomiasis. His M.D. thesis on "Ankylostomiasis in Grenada" was of special importance in definitely associating with this infection a series of hitherto obscure cardiac symptoms. Dr. Leiper writes:—"In him we have lost one of peculiarly charming personality, wide sympathies and interests. Knowing as he did the risk of overstrain, which actually proved fatal, he courageously discharged until within a day of his death, not only his own duties, but also those of others, away on active service."

A CHRISTMAS course of juvenile lectures will be delivered at the Royal Institution by Prof. D'Arcy Thompson on "The Fish of the Sea," beginning on December 31 at 3 o'clock. The following courses of lectures will be given before Easter:—Prof. Spenser Wilkinson, *Lessons of the War*; Prof. MacGregor-Morris, *Study of Electric Arcs and their Applications*; Capt. G. P. Thomson, *The Development of Aeroplanes in the Great War and The Dynamics of Flying*; Prof. Hele-Shaw, *Clutches*; Prof. Arthur Keith, *British Ethnology: The People of Scotland*; Prof. Norman Collie, *Chemical Studies of Oriental Porcelain*; Dr. W. Wilson, *The Movements of the Sun, Earth, and Moon*; Prof. H. M. Lefroy, *Insect Enemies of our Food Supplies and How Silk is Grown and Made*; Prof. C. H. Lees, *Fire Cracks and the Forces Producing Them*; Prof. A. Findlay, *Colloidal Matter and its Properties*; and Sir J. J. Thomson, *Spectrum Analysis and its Application to Atomic Structure*. The Friday discourses will begin on January 17, when Sir James Dewar will give a lecture on *Liquid Air and the War*; and discourses will also be delivered by the following gentlemen:—Lt.-Col. A. Balfour, Prof. H. H. Turner, Prof. J. G. Adami, Prof. C. G. Knott, Mr. A. T. Hare, Prof. J. A. McClelland, Prof. H. C. H. Carpenter, Prof. A. Keith, Prof. W. W. Watts, Sir John H. A. Macdonald, and Sir J. J. Thomson.

INFLUENZA is very decidedly on the wane in England and Wales. The Registrar-General's return for the

week ending December 7 shows that for the ninety-six great towns the deaths from the epidemic were 3574, which is less than one-half of the deaths in either of the two weeks ending November 9, when the complaint was at its climax. In the eight weeks ending December 7 there were 41,053 deaths from influenza in the ninety-six great towns. The *Times* of December 7 gave the following from its New York correspondent:—"Deaths among the civilian population of the United States from Spanish influenza and pneumonia since September 15 have totalled approximately 350,000. In military camps the number of deaths has exceeded 20,000." In London the deaths from influenza for the week ending December 7 were 660, which is lower than any week since that ending October 19, and is little more than one-quarter of the deaths in either of the two weeks ending November 9. The age incidence of the deaths is higher than in any previous week of the epidemic, 42 per cent. of the deaths occurring at ages above forty-five. The proportion of deaths in London from pneumonia has been smaller than the deaths from bronchitis throughout the epidemic until the week ending December 7, when the deaths from bronchitis were slightly the greater.

THE death is announced, at thirty-five years of age, of Dr. A. E. Stansfeld. From the *British Medical Journal* we learn that Dr. Stansfeld entered St. John's College, Cambridge, with a major scholarship in 1902, and gained First Class honours in both parts of the Natural Sciences Tripos, graduating B.C. in 1909, and proceeding to the M.D. degree in 1915. At St. Bartholomew's Hospital his career was exceptionally brilliant. He won there an entrance scholarship, the Kirkes scholarship and gold medal, the Burrows prize, the Brackenbury medical scholarship, and the Lawrence scholarship and gold medal. After holding the post of house physician he was appointed casualty physician and assistant demonstrator of pathology in the medical school; and at the date of his death on November 25 he was senior demonstrator of pathology at St. Bartholomew's, and physician to the Metropolitan Hospital. In 1911 Dr. Stansfeld obtained the membership of the Royal College of Physicians, and he was elected to the fellowship this year.

THE KING has been pleased to approve the appointment of the Rev. E. W. Barnes, F.R.S., Master of the Temple, to the Canonry of Westminster, vacant owing to the death of the Right Rev. William Boyd Carpenter, D.D., K.C.V.O. Dr. Barnes went to Cambridge from King Edward's School, Birmingham, as a scholar of Trinity, and graduated in 1896, being bracketed as Second Wrangler. In the following year he was placed in the first division of the First Class in the Mathematical Tripos, part ii., and became first Smith's prizeman in 1898. He was president of the Union in 1897, and in 1898 was elected a fellow of his college, afterwards becoming assistant lecturer (1902), junior dean (1906-8), and tutor (1908-15). He was elected a fellow of the Royal Society in 1909.

WE notice with regret the death on December 9, at Basle, of Mr. F. G. Aflalo, at forty-eight years of age. Mr. Aflalo was well known as a traveller, an angler, and author of numerous popular writings on natural history, especially that of fishes. He travelled widely, among other places visiting every fishing port of note. He was the editor of the "Encyclopædia of Sport" and the "Anglers' Library." In 1893 Mr. Aflalo founded the British Sea Anglers' Society, which is now a flourishing association.

MR. CLIFFORD C. PATERSON is resigning his position in the physics department of the National Physical Laboratory, Teddington, and is joining the General

Electric Co., Ltd., as director of research laboratories as from January 1, 1919. Pending the erection of the necessary laboratory buildings the temporary offices and address of the research laboratories of the General Electric Co., Ltd., will be at the Osram Robertson Lamp Works, Hammersmith, London.

ALL the exhibition galleries of the Natural History Museum, Cromwell Road, S.W., are now open to the public on weekdays as in pre-war times. The hours of opening during December, January, and February are from 10 a.m. to 5 p.m.

DURING the present year the Irish newspapers reported the discovery of the apparition of a black pig in the district of Kiltrustan, Co. Roscommon, which caused much alarm, and was supposed to forebode some serious national disaster. The question has been fully discussed by Miss Eleanor Hall in *Folk-lore* (vol. xxix., part 3, September, 1918). The writer shows that the legend of the appearance of the black pig is as ancient as anything we possess in these islands, and that it is specially connected with the great ditch known as the "Black Pig's Dyke," which can be traced in fragments all across the north of Ireland from Bundoran to Donegal Bay, and probably formed the boundary in ancient times of southern and eastern Ulster. The pig seems to have been a sacred animal in ancient Ireland, possibly the representative of the corn spirit, and the hunt of magical boars or swine is the theme of many tales. It is remarkable that it should recently have been resuscitated in Ireland for purposes of religious or political propaganda.

In the November issue of *Man* Prof. G. Elliot Smith discusses an exhibit now in the Liverpool Free Public Museums obtained in excavations in Honduras. It represents an alligator or crocodile, from the open mouth of which a human face protrudes. The writer identifies this with various forms of the dragon in India, Japan, and Indonesia, and arrives at the conclusion that "no one who conscientiously studies the mythology of the Old World, and appreciates the fortuitous circumstances which determined the arbitrary forms assumed by many of the beliefs and ideas, can refuse to admit that the confused mosaic of the identical elements of culture in America must have come from the other side of the Pacific, and, for the most part, received the impress of Indian civilisation before the fragments were rearranged and built up again into a new pattern in Mexico and Central America."

In recent years several discoveries of remains of ancient man in North and South America have been announced, which are critically reviewed by Dr. Ales Hrdlička in Bulletin No. 66 of the Bureau of American Ethnology. The La Brea skeleton, found in California in 1914, is now shown to possess no characteristics representative of any Americans earlier than the Indians. A long and careful review of the "fossil" man of Vero, Florida, leads to the conclusion that the remains are of modern Indian type, and represent intentional burials. Dr. Hrdlička adds the useful warning that "those in whose work credulity and fancy have no part, and who possess sufficient hard-earned experience in these matters, can be convinced of geologically ancient man in America only by facts that will make all conscientious doubt on the subject impossible. As chances of peculiar associations of human bones or human artifacts are infinite, anthropology in this country must expect to be called upon again and again to pass on alluring claims of the antiquity of such objects. But the burden of proof

of antiquity of such finds lies, and will always lie, with those who may urge such claims. They must show clear, full, conclusive evidence acceptable to anthropology; and no beliefs, opinions, or convictions, even though advanced by men otherwise deserving, can ever take the place of real and sufficient evidence. Our colleagues in collateral branches of science will be sincerely thanked for every genuine help they can give anthropology, but they should not clog our hands."

AN interesting account is given by Mr. Y. Nishikado (*Ber. d. Ohara Inst. f. landwirtsch. Forsch.*, Bd. i., Heft 2, 1917) of the rice blast fungus (*Piricularia*), which causes serious damage to rice in Japan as well as in other countries. Various strains of this fungus were isolated from rice, Italian millet, green fox-tail grass, crab grass, *Zingiber mioga* and *Z. officinale*. By infection, cultural experiments, and morphological study it was shown that these strains exhibited a marked degree of specialisation to their host, as well as showing other differences of a morphological and physiological character. The author, therefore, distinguishes four species from one another, viz. (1) *Piricularia oryzae*, Br. and Cav. Emend., on rice; (2) *P. grisea* (Cke), Sacc. Emend., on crab grass; (3) *P. setariae*, sp. nov., on Italian millet and green fox-tail grass; and (4) *P. zingiberi*, sp. nov., on *Zingiber mioga* and *Z. officinale*. All the above species grow readily as saprophytes upon artificial media, such as rice-decoction agar. On media containing carbohydrates the fungal growth becomes deep olive to olivaceous-black, according to the species; but, grown without carbohydrates (such as on bouillon agar), the hyphae remain white. The physiological relationship of the four species of *Piricularia* to various culture media, temperature, oxygen, etc., was carefully recorded. *Piricularia* species were found to exhibit a long vitality (of more than four hundred days) in cultures; moreover, in dry conditions the spores of *P. oryzae* maintain their vitality from the autumn until the next summer (about eight months). Therefore the spores may be a source of early infection.

WE have received the year-book and annual rainfall returns of the Norwegian Meteorological Institute for the year 1917. The mean temperature of the year, taking the country as a whole, was in close agreement with the normal, but there was a rather marked deficiency of warmth north of the Arctic Circle, the mean temperature at Alten (lat. 70° N.) being 1.4° C. under the average. January and July were remarkably warm in all parts, while, on the other hand, April and October to November were unusually cold. An interesting summary of the climatic conditions for 1916 is given for Green Harbour, Spitsbergen, the most northern meteorological station in the world, situated in lat. 78° 2' N. The mean temperature of the year was -10.1° C. (13.8° F.), with extremes of 10.8° C. (51.5° F.) on July 1 and -45.7° C. (-50.2° F.) on January 6. Only in August did the temperature remain above freezing-point. Precipitation was scanty, and amounted to only 11.36 in. Hourly values of temperature and pressure at Green Harbour are given for the year ended June, 1917, along with the tri-daily readings of the various climatic elements. Full particulars of rainfall and other forms of precipitation during 1917 are given for 475 stations, the daily readings being shown for most stations. Monthly and annual values expressed as a percentage of the average are shown for sixty-four stations, the greatest excess, 45 per cent., occurring at Engset (lat. 62° 14' N., long. 7° 15' E.), and the maximum deficiency, 41 per cent., at Lille-

hammer (lat. $61^{\circ} 7' N.$, long. $10^{\circ} 28' E.$). The isohyets are drawn on two large-scale maps, which show clearly the sharp variations in rainfall peculiar to a mountainous country like Norway, the extremes ranging from 3400 mm. to 300 mm. of rain in the year.

THE importance of the refractometer to the technical chemist and physicist is being realised to an ever-increasing extent. The determination of the refractive index of a liquid can be made quickly and accurately by means of such an instrument, thus affording valuable information as to the purity of oils, fats, or drugs, or the concentration of solutions. The investigation of the optical properties of glasses and singly and doubly refracting crystals can be carried out with the same instrument. It is highly satisfactory to learn that British manufacturers are paying considerable attention to the construction of refractometers. We have received from the firm of Messrs. Adam Hilger, Ltd., a well-illustrated booklet describing their Abbe refractometer with water-jacketed prisms for the measurement of refractive indices from 1.3000 to 1.7000. The instruments are standardised, and not only the mechanical, but also the optical, parts are interchangeable. We have also received an account of the improved type of Abbe refractometer designed and made by Messrs. Bellingham and Stanley, Ltd. An interesting comparison is made between the features of this instrument and the corresponding features of the German type, and it is claimed that the increased efficiency results in a saving of time of about 50 per cent. in the determination of refractive indices and dispersions.

PROF. MILES WALKER read an interesting paper to the Institution of Electrical Engineers on December 5 on the supply of single-phase power from three-phase systems. In this country the advantages of three-phase distribution of power are thoroughly appreciated, and many of our large power-stations generate electrical power on this system. At the present time there is a great demand in the Midlands for electric power for smelting furnaces. As these furnaces make an excessive demand on the supply station, the companies insist that the load taken by the furnaces must be a "balanced" load, and that suitable precautions are taken to prevent resonance effects, which have on several occasions caused a breakdown of the system. For reasons which are not fully stated in the paper, Prof. Walker urged the adoption of the single-phase furnace. He described the various methods that could be used to operate this furnace without upsetting the balance of the mains. He gave full particulars of the design of a "rotating balancing transformer" for this purpose. The tests made on this machine show that its efficiency was more than 90 per cent. This is a very satisfactory achievement. We are not convinced, however, that it is best to use a single-phase furnace when the supply is three-phase. We know several excellent types of three-phase furnace, and it is possible to connect them with the three-phase transformer, so that the power factor on the primary windings is nearly unity. But even if a single-phase electric furnace was essential, why not use a choking coil, a transformer, and a rotary condenser separately? There is no need to combine them into a single machine.

An interesting paper on the air supply to boiler-rooms was read by Mr. Richard W. Allen at the Institution of Engineers and Shipbuilders in Scotland on October 22. The paper deals with the closed-stokehold system, and a large part of it is taken up with the losses in the ducts and fan chambers, due to unscientific design. Records are given of experi-

ments conducted on new types of deck intakes, weather flaps, gratings, etc., designed in such a manner as to secure stream-line flow in the currents of air, and the results of experiments carried out on older patterns of the same appliances are also included. For example, a grating having bars of rectangular section produced a drop in pressure of from 0.065 in. to 0.22 in. of water, whilst another having "stream-line" bars showed no perceptible drop in pressure. The delivery through these gratings with the fan running at the same speed was respectively 29,000 and 31,500 cubic ft. of air per minute. The paper constitutes a valuable illustration of the applications of science to engineering design, and as such is to be commended to any engaged in the design and installation of fans.

THE salvage of the *St. Paul* forms the subject of an interesting article in the *Engineer* for December 6. It may be remembered that this ship heeled and sank in New York harbour in April of the present year. The hull settled upon the river-bed with the decks nearly vertical, and penetrated through the bed of silt into the underlying hard soil. This rendered the matter of the removal of guns, etc., a process of considerable difficulty for the divers. Excavational work was done by means of jets of compressed air, thus blowing away the mud which had accumulated round the guns. The ooze also entered the ship through numerous open ports, and hampered the work greatly. The dead-weight of the ship is about 13,000 tons, and the ship had to be rolled forcibly back towards the normal upright position without damage. This was accomplished by use of surface pontoons, of A-frames attached to the uppermost side of the ship, and of pumps which cleared the water partially out of the ship. Four pontoons were used which exerted, on the rising tide, a lift of 1200 tons, and produced a righting moment on the ship. The rolling operation took about seven days to accomplish. The final operation comprised the pumping out of the entire vessel. It is of interest to note that the engineers responsible adapted the oxy-acetylene torch for under-water service, and employed it for cutting drainage openings in various parts of the ship. The entire salvage operation has been accomplished with conspicuous success.

THE poisonous character of some cargoes of Burma beans having been noticed, it was suggested that the Burma Department of Agriculture should encourage the cultivation of varieties containing less hydrogen cyanide than does *Phaseolus lunatus*. It has been found, however, that imported Madagascar beans were not suited agriculturally to replace Pe-gya and Pe-byugale, and that the prussic acid content increased during two years' cultivation. As bearing on the same problem, the agricultural chemist of the Government of Burma has studied the hydrogen cyanide content of the commonest Burma bean, Pe-gva. The results obtained are described in Bulletin No. 79 of the Agricultural Research Institute, Pusa, by Messrs. F. J. Warth and Ko Ko Gvi. It was found that the method of estimating hydrogen cyanide by distillation (after hydrolysis of the glucoside with acid) into sodium hydrogen carbonate solution and titration with iodine solution could not be used owing to the presence of a substance which gives a slight iodine reaction. The prussic acid was therefore estimated by conversion into Prussian blue, which was ignited and weighed as ferric oxide. Details of the method are given in the bulletin. From about one hundred single-plant samples collected in the cultivators' fields of the Sagaing district ten samples of seed were selected, including two of the highest hydrogen cyanide con-

tent, two of the lowest, and four intermediate. These were grown in Hmawbi (high rainfall), Tatkon (intermediate rainfall), and Mandalay (low rainfall). From the results of the analyses of the seeds obtained the following conclusions are drawn:—(1) That the hydrogen cyanide content is an inherent character of pure single-plant cultures; (2) the content varies considerably with the soil and climatic conditions; (3) that cultures giving low amounts of hydrogen cyanide in one locality give low figures under all the conditions tested; (4) that differences in the colour of seeds from a single culture are not correlated with the different hydrogen cyanide content of their progeny; and (5) that the best cultures hitherto found contain prussic acid, but only half that present in the originally imported Madagascar bean.

MESSRS. STANDLEY BELCHER AND MASON, LTD., Church Street, Birmingham, writing with reference to the article on scientific glassware contributed by Dr. M. W. Travers to NATURE of December 5, state that "already by November, 1914, we were supplying beakers, etc., made in our own moulds, from a formula supplied by us." In Dr. Travers's article those firms only were mentioned which mark their glass with the name of the maker and the words "British made," and that accounts for the omission of the names of other firms. No injustice was intended, but it must be admitted that, by displaying and selling glassware which does not bear the maker's name, certain dealers fail in their obligations to British industry and belong to a different category from firms concerned solely with ware distinctly shown to be of British manufacture.

OUR ASTRONOMICAL COLUMN.

FIREBALL ON DECEMBER 6.—At 9h. 36m. a very fine meteor was observed at Bristol, Weston-super-Mare, and Falmouth. The object lit up the partially clouded sky like a vivid flash of lightning. From the descriptions already to hand it appears that the meteor moved slowly from a radiant at $133^{\circ}+60^{\circ}$, and fell from a height of 67 to 24 miles along a path of 67 miles. The position was from above Rhayader to south-east of Carmarthen, in South Wales, but further observations are necessary for the determination of very trustworthy results.

COMET 1918d (SCHORR).—A new comet, of feeble luminosity, was discovered at Bergedorff (Hamburg) by Dr. Schorr on November 23. From observations made on November 23, 24, and 25, Messrs. J. Braae and J. Fischer-Petersen have calculated the following orbital elements:—

$$\begin{aligned} T &= 1918 \text{ August } 7^{\text{h}} 06^{\text{m}} \text{ G.M.T.} \\ \omega &= 230^{\circ} 42' 18'' \\ \Omega &= 129^{\circ} 16' 90'' \\ i &= 5^{\circ} 27' 21'' \end{aligned} \quad 1918^{\circ} 0$$

$$\log q = 0.19222$$

The following is an extract from the ephemeris:—

1918	R.A. 1918 ^o	Decl. 1918 ^o	Log r	Log Δ
	h. m. s.			
Dec. 21	3 58 15	+12 54.3	0.3749	0.1666
25	3 57 41	+13 10.3	0.3816	0.1844
29	3 57 30	+13 27.1	0.3883	0.2024

During December the computed brightness ranges from the 14th to the 15th magnitude.

SPECTRA OF BINARY STARS.—In a communication to the American Astronomical Society (*Pop. Ast.*, vol. xxvi., p. 635) Dr. R. G. Aitken summarises the results of a comparison of his list of close double-stars with the unpublished new Draper Catalogue of stellar spectra. The spectral classes of 3919 pairs,

including practically all those as bright as 8.5 B.D. magnitude, were identified, with the results shown in the following table, which also includes the 605 spectroscopic binaries (in the entire sky) which were known in October, 1917:—

Spectral Class	Visual Binaries Numbers	Percentages	Spectroscopic Binaries Numbers	Percentages
0-B8	157	4	198	33
B9-A3	1251	32	161	26
A5-F2	532	14	61	10
F5-G0	1093	28	71	12
G5-K2	837	21	95	16
K5-Md	49	1	19	3
Totals	3919	100	605	100

The figures show that while spectroscopic binaries are most numerous among stars of class B, the visual binaries are relatively most numerous among stars of class G.

A NEW "SOLAR CONSTANT" OBSERVATORY.—The Smithsonian Institution has established an observing station at Calama, Chile, for further investigations of the apparent variations of the solar radiation, to which so much attention has been given by the director, Dr. C. G. Abbot (*Pop. Ast.*, vol. xxvi., p. 633). The site is 2250 metres above sea-level, and, according to several years' records, is the most cloudless station in the world. For the two years 1913-14 the average number of wholly cloudless days at 7 a.m. was 228, at 2 p.m. 206, at 9 p.m. 299, and of completely cloudy days none. The precipitation is zero, and the temperature seldom falls below 0° C. or rises above 25° C. The observational conditions would thus appear to be extremely favourable for the work contemplated.

MEDICAL RESEARCH.

MUCH has been said of late as to the importance of encouraging research work in the applied sciences. In the fourth annual report of the Medical Research Committee¹ we have ample illustration of the enormous field presented for research work in medical science under conditions both of peace and of war. The diversion of scientific research to war purposes has nowhere led to more marked service than in the sphere of medical research. When considered from the point of view of mere economy of expenditure, and quite apart from the enormous saving of life and suffering, medical research is shown to pay; thus, by improved methods in the treatment of heart cases at the Colchester Hospital, cures were effected more rapidly, with a consequent saving of 50,000l. in a single year.

Although attention has naturally been focussed on the magnitude of pain and on the toll of life involved in war casualties, it must not be forgotten that in times of peace the volume of avoidable suffering and loss is measurable in terms of similar magnitude to those which obtain in war. Among the grave problems with which we are now faced is that of the low standard of our national physique, the statistics of which have recently been described by the Prime Minister as "staggering." The investigations carried out under the auspices of the Medical Research Committee on problems connected with tuberculosis, rickets, growth factors, industrial diseases, industrial fatigue, etc., are a step towards the scientific establishment of a healthy race, and have already reached important results.

A remarkable feature of medical research since the

¹ Fourth Annual Report of the Medical Research Committee, 1917-18 (London: H.M. Stationery Office, 1918.) Price 4d. net.